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Proceedings of Indian conference on Bioinformatics (Inbix'17)

Bhramar Dutta and The Program Committee, Indian Conference on Bioinformatics 2017

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Bioclues.org, an affiliate of International Society of Computational Biology (ISCB)and Asia-Pacific Bioinformatics Network (APBionet) and Birla Institute of Scientific Research (BISR) jointly organized Indian conference on Bioinformatics (Inbix'17) promoting wide scale of Indian association with Bioinformatics. The Program Committee was setup a year ago and The keynote, invited talks, ideation challenges, panel discussions stub talks, elevator pitches forming the program was designed by programme committee (PC) of the Bioclues. The conference took place in the premises of BISR during November 7-9, 2017. The rapid advent of second and third generation sequencing technologies during the last decade has enabled biology to enter the era of 'Big Data'. However, the computational efficiency of analysing the large-scale dataset in terabytes or even petabytes has become a bottleneck. In this regard, Bioinformatics is considered to play a crucial role in this era having input of software based tools for designing new algorithms, databases besides managing applications in molecular medicine, drug development, crop improvement, gene therapy, microbial genome application, genome assembly etc. Keeping in view of this, the PC has setup a multitude of sessions as discussed aforementioned to ensure there are healthy deliberations. The Inbix'17 program has received an overwhelming response with participation of 190 active delegates besides keynote speakers, invited speakers, oral and poster/stub presenters. The PC received a good support from a handful of sponsors besides financial support from central ministries of Biotechnology, Science and Technology and Rajasthan State Department of Science and Technology.

The conference kicked off with a much awaited keynote by Chief Guest Temple F Smith of Boston University, USA on "What our immense data can and may tell us". He had presented an outline of the evolution of the translational protein machinery which performs metabolic and signalling function of a cell. The aminoacyl tRNA synthetases perhaps provide the most interesting information along with nucleotide transferase associated proteins. Science has diversed a lot and employs the latest technology but the origin of genetic code remain largely hidden. There is no clear imprint of full genetic translation system and effect of mutation in origin of genetic code which might has potential implications for future genetic disease understanding. He also elucidated the early evolution of the active site of ribosome and throws some light in RNA-world as the earliest steps towards living systems. This session was chaired by V.M. Katoch, former Director General, Indian Council of Medical Research and GPS Raghava, IIIT, Delhi. The keynote ended with gripping questions which lasted until the end of high tea networking.

As a part of the entire program, there were six sessions besides the panel discussions. The first session kicked off with an invited talk by N Srinivasan, IISc, Benguluru. He shared an approach to bridge gaps between the related protein families through HMM-HMM alignments, where alignments were to be applied for roulette wheel-based method for understanding how de-DUFing could be attributed to ascertain the functions for domains of unknown function (DUF). The

session was chaired by Temple F. Smith and P.K. Gupta, INSA Emeritus Scientist, CCSU, Meerut. The invited talk was followed by Jayaraman Valadi, Pune University on multi label classification methods and discussed about their merits and limitations and some approaches to improve performance. Later, Kamalraj Pardasani, MANIT, Bhopal highlighted on the quantitative study of thermal patterns in human body and gives clues of its various clinical applications. Oral presentation was rendered by Amir W Khan from ICRISAT Hyderabad dealing with whole genome re-sequencing of chickpea genotypes and genome-wide variations.

Post-lunch, the second session began to understand the nature and structural bioinformatics where Jayaraman Valadi and Saikat Chakrabarti, IICB, Kolkata, served as chairpersons. R Sowdhamini,NCBS, Bengaluru described about domain swapping in proteins followed by H.A Nagarajaram, University of Hyderabad on the protein-protein interaction network and enlightened the existence of local hubs and global hubs. M. Michael Gromiha, IIT Madras, Chennai told about integration of the computational methods and predicted the interactions of proteins. Oral presentation was given by Md Aksam, VIT, Vellore on neural network based side effect prediction and showed the side effect free cancer targets in MAPK pathways. US Raghavender, BISR, Jaipur and R K Gothwal, BISR, Jaipur chaired the tea with parallel poster presentations. The panel discussion on "Where India is heading Next generation sequencing (NGS)" was initiated with different views of Rajeev Varshney, ICRISAT, Hyderabad, Mr. Avadh Shah, Xcelris Labs, Ahmedabad, Raja C Mungasimangalam, Genotypic Technology, Bengaluru and Gourja Bansal,Premas Life Science, New Delhi, chaired by Prashanth Suravajhala, BISR, Jaipur and Vishal Acharya, CSIR-IHBT, Palampur. The panel discussion was well received with a touch of sense of humour and a gripping science on the next-generation technologies and their role in future NGS India. PK Gupta and a host of senior Geneticists have taken the deliberations to Human Microbiota emphasizing the need for understanding better collaboration of cross-disciplinarians. Prashanth suravajhala and Vishal Acharya stressed the need for 1000 India genome (IKIG) in pipeline which they proposed along with Khader Shameer. The conference has the day one ending with an invited talk delivered by Shandar Ahmad, JNU, New Delhi as an APBioNet representative on the challenges and opportunities in data driven biology.

The day two of the conference started with a virtual tutorial on computational medicine by Khader Shameer et al. from Northwell Health, USA. In this tutorial Shameer et al. described the large scope of learning by using databases, algorithms and tools that can improve the survival rate of patients through Artificial Intelligence (AI) and drug repurposing approaches. The second keynote by Thomas Sicheritz-Pontén, Denmark Technical University: "On the omics of rainforest" was well received which the address focused on the integration of large scale -omics data and approaches" by providing breakthroughing hypothesis . The third session on "Next generation sequencing in the age of bioinformatics" with Thomas Sicheritz-Pontén and Krishna Mohan, BISR, Jaipur, as the chair session chairs, was started with invited talk by Rajeev Varshney on genomics- assisted breeding in semi-arid tropics legume crops. He highlighted the recent advances in pulse and Chickpea genomics leading to the development of high yielding stress tolerant cultivars.

As an industrial invited talk, Raja C Mugasimangalam described how long DNA sequence reads from PacBio and Nanopore sequencers have been helpful to find the diagnoses. He further pointed out that long reads are ideal for viral diagnostics along with the short reads can be used in genome information. Following which, Andrew Lynn, JNU, New Delhi in his speech described on installable Galaxy workflow management system for NGS data analysis. The session ended with Buddini Pramudika Abhayawickrama from Sri Lanka focusing on whole genome resequencing of a salt susceptible rice verity in Sri Lanka and she find out some variant responsible for the salt susceptibility. Buddine received an international travel grant from the PC for her oral presentation.

The fourth session of the program after lunch was invited talk by Saikat Chakrabarti, IICB, Kolkata, on computational approaches of bio-molecular interaction network. His objective was to create a holistic picture of interacting metabolic pathways using computational system. The talk was followed by Naidu Subbarao from JNU, New Delhi. He put some points on drug target identification based on comparative metabolomics. He reported few genes which could be a potential drug target. Lakshmipati Vadlakonda, Kakatiya University, Warangal, focused his lecture on energy supply for epigenetic modification of gene expression. He concluded that increasing supply of ATP in cancer cell produced by TCA cycle in mitochondria has a (sibling) rivalry relationship in respiratory chain. Aparna Banerjee from University of Burdwan, West Bengal, delivered an oral presentation on the area of non-pathogenecity of Bacillus anthracis and showed comparative genome wide evolutionary perspectives. A short tea break with poster networking was in between. Panel discussion on ethics in publishing was held after this concluded session where Tiratha Raj Singh from JUIT, Solan, H.P. and Surendra Nimesh from CURAJ, Kishangarh, conducted the session. N Srinivasan, Madhurima Kahali from Springer India and SL Kothari, Amity University, Jaipur gave their views on various aspects of ethics in publishing. A special session on women in biology was conducted by some eminent women scientist across India, R Sowdhamini, Niha Kulshreshtha, CCT, University of Rajasthan, Sumita Kachchawa of University of Rajasthan and Nidhi Pareek, CURAJ, Kishangarh. Earlier, Sowdhamini presented a wonderful presentation on how she overcame the odds being a woman scientist and raising her position from motherhood. Manika Sehgal and Sampat Nehra engripped the session wonderfully with thoughts, debate and future actions while everybody enjoyed the rigorous discussions. For Bioclues Innovation, Research and Development (BIRD) awards, Rajib Bandopadhyay, University of Burdwan, West Bengal and Nidhi Gupta from the IIS University, Jaipur chaired the session. Announcement of the names of BIRD awardees given away by Bioclues and the awards were presented to Vanika Garg from ICRISAT, Hyderabad and Sushmita Paul from IIT, Jodhpur. India, being a multi-cultural, multi-ethnic and multi-traditions of religions deserve some performing arts which reflects her cultural diversities. Not to forget the first night's banquet dinner at palatial Golden resorts with Rajasthani culture and the second evening's dinner at Amber Vatika, an ethnic resort.

During the last day of program, a much awaited tutorial focusing on Grantsmanship: How to write a winning grant proposal, Kicked off. Chaired by Harpreet Singh, HMV college, Jalandhar and Vishal Acharya, CSIR-IHBT, Palampur with panelists in the form of P.K Gupta, NK Lohiya, Emeritus Professor, University of Rajasthan and MP Punia, BISR, Jaipur

gave the tips and traps on how to reach the pinnacle of success for a grant proposal. The third keynote speaker of the program was GPS Raghava where he mentioned the contribution of India in the field of informatics based biological health. He presented a scenario of developing Bioinformatics in India from last decades to present date and its services in biomedical sciences. This session was followed by tea breaks with video abstracts. The fifth session was chaired by Naidu Subbarao and Pawan Dadheech, CURAJ, Kishangarh. Invited talk by R S Rathore, Central University of South Bihar, Gaya, emphasized on dual binding of Acetylcholinesterase inhibitors and discovery of cation interactions. He also reported new scaffolds as potent inhibitor for AChE. Another invited talk by G.Narahari Sastry, IICT, Hyderabad on how to develop disease specific web portals by large scale available of chemical compounds gave a good thought-provoking questions on the applications of Molecular Property Diagnostic Suite (MPDS). The BIRD Awardees, viz. Vanika Garg, ICRISAT, Hyderabad and Sushmita Paul, IIT, Jodhpur, incidentally both women were honored for the year 2017. While Vanika presented her work on computational approaches for handling genome data for amplifying breeding efficiency in legumes, Sushmita spoke on combining approaches for generating network to identify differently expressed miRNA-mRNA regulatory modules in colorectal cancer respectively. Ankita Shukla, JUIT, Waknaghat, in her oral presentation emphasized on structure based inference of single nucleotide polymorphism "L28F" that lead to colorectal cancer. Post-lunch, the sixth and final session was held on career in bioinformatics question and answer series. The three panellist GPS Raghava,T Madan Mohan, DBT, Government of India and Andrew Lynn gave many proliferative ideas, ways, views for choosing bioinformatics as career option and strived to pleased the young minds answering several questions . The final panel discussion started with Sammi Bhatia, Medius Health, Australia, Amrit Ravi, Brainpan co, Gurugram, Vikram Singh Chauhan, Birla Hospitals and Saarthak Bakshi from International Fertility Centre serving as panelists on digital health and big data with VS Sundarajan, Singapore and Aditya Saxena, GLA University, Mathura as rapporteurs. In the closing ceremony, Jayaraman Valadi read out the report of three days program of the conference and gave the concluding speech by narrating the importance of bioinformatics in today's scenario.

The conference concluded with closing remarks followed by farewell tea and general body meeting announces to organize Inbix'18/Incob'18 during September 25-28 in Jawaharlal Nehru University, New Delhi. The organizers believed that the Inbix 2017 conference served the needs of researchers coming across multi-disciplinary fields taking forward the scientific needs of igniting young minds. Bioinformatics has eschewed compiling big data not only in Biology and Healthcare but also on genome-wide extensive studies to achieve its goals in interdisciplinary ways. The PC was interested to stress this approach thereby bringing the scientific decorum to practice, nurture bioinformatics besides taking hippocratic oath on science communication that India has has challenges on. A need was however felt to organize such events across different states of India to encourage people so that bioinformatics especially from rural and tier II cities take it's biochemical roots in making the next generation bioinformaticists reach the pinnacle of success. Long hail Bioinformatics in India!

-From the Program Committee

*https://easychair.org/cfp/Inbix2017